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made at one of the meetings of the Royal Astronomical Society in 1877 (see the *Astronomical Register*, vol. 15, p. 159). A closer conjunction, both heliocentrically and geocentrically, than that of 1683, was that of July 1623, which was, however, invisible, as it took place not long before the conjunctions of the two planets with the Sun. After twenty-two heliocentric conjunctions since 1623, the next minimum conjunction will occur in May 2080, in which year the two planets will come into opposition to the Sun early in August. The following minima will occur in May 2477, January 2875, &c. An examination of the question, made with the help of Le Verrier's tables in 1878, has satisfied me, that during the next two thousand years as well as during the last two thousand years, or during a full period of four thousand years, no conjunction of the two planets can be found, which takes place so near to the line of nodes of their orbits as to produce a transit of *Jupiter* across the Sun's disc for *Saturn*, or an occultation of *Saturn* by *Jupiter* for observers on Earth.

Ephemeris of the Satellites of Mars, 1886. By A. Marth.

The values of the longitude of the node N and of the inclination J of the orbit of *Deimos*, in reference to the plane of the Earth's equator, employed in the following ephemeris, are

$$N = 49^{\circ}{\cdot}533, \qquad J = 36^{\circ}{\cdot}037.$$

The assumed proportion of the mass of the Sun to that of *Mars* is

$$\odot = 3095000.$$

The orbital longitude of *Deimos*, reckoned from the node, is

$$u_2 - 141^{\circ}{\cdot}43 + 285^{\circ}{\cdot}1616\,(t - t_0),$$

the epoch t_0 being 1886, March 14·0 Gr.

Phobos is assumed to move in the plane of the orbit of *Deimos*, and its longitude is taken to be

$$u_1 = 56^{\circ}{\cdot}54 + 1128^{\circ}{\cdot}8492\,(t - t_0),$$

its value being a little uncertain, as only two position-angles observed during the last opposition are available.

The periods of the sidereal revolutions corresponding to the assumed daily rates of motion are for

Phobos $7^{h}\ 39^{m}\ 13^{s}{\cdot}72$,

and for

Deimos $30^{h}\ 17^{m}\ 54^{s}{\cdot}99$.

a, *b* major and minor semi-axes of the apparent ellipses described by the satellites.

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P position-angle of the minor axes.

U + 180° and B, areocentric longitude and latitude of the Earth referred to the plane of the orbit of *Deimos*, and reckoned from the node.

$u - U$ longitudes of the satellites, reckoned in their orbits from the points which are in superior conjunction with the planet's centre.

Greenwich Noon. 1886.	*Phobos.* a_1	b_1	$u_1 - U$	P	*Deimos.* a_2	b_2	$u_2 - U$	U	B
Feb. 10	17″·36	+ 6″·68	158°·98	22°·13	43″·43	+ 16″·73	245°·49	129°·54	+ 22°·65
11	17·48	6·72	208·09	22·02	43·74	16·83	170·89	129·32	22·62
12	17·60	6·76	257·21	21·91	44·05	16·93	96·30	129·08	22·60
13	17·72	6·80	306·34	21·79	44·35	17·03	21·72	128·82	22·58
14	17·84	6·84	355·49	21·66	44·65	17·13	307·16	128·56	22·55
15	17·96	6·88	44·65	21·53	44·93	17·22	232·60	128·28	22·53
16	18·07	6·92	93·82	21·39	45·21	17·31	158·06	127·99	22·51
17	18·18	6·95	143·00	21·24	45·48	17·40	83·53	127·69	22·48
18	18·28	6·98	192·19	21·09	45·74	17·48	9·02	127·37	22·46
19	18·38	7·02	241·39	20·93	46·00	17·56	294·51	127·05	22·44
20	18·48	7·05	290·60	20·77	46·24	17·63	220·01	126·71	22·42
21	18·57	7·07	339·81	20·60	46·47	17·70	145·53	126·37	22·39
22	18·66	7·10	29·04	20·42	46·69	17·77	71·05	126·01	22·37
23	18·74	7·12	78·27	20·24	46·89	17·83	356·58	125·64	22·35
24	18·82	7·15	127·51	20·06	47·08	17·88	282·12	125·27	22·32
25	18·89	7·17	176·76	19·87	47·26	17·94	207·67	124·89	22·30
26	18·96	7·19	226·02	19·67	47·44	17·99	133·22	124·50	22·28
27	19·02	7·20	275·28	19·47	47·60	18·03	58·78	124·10	22·26
28	19·08	7·21	324·55	19·27	47·74	18·06	344·35	123·70	22·23
Mar. 1	19·13	+ 7·23	13·82	19·06	47·86	+ 18·09	269·93	123·29	+ 22·21
2	19·17	7·24	63·09	18·85	47·97	18·12	195·51	122·88	22·19
3	19·21	7·24	112·36	18·64	48·06	18·14	121·09	122·46	22·17
4	19·24	7·25	161·64	18·42	48·14	18·15	46·67	122·04	22·15
5	19·26	7·25	210·92	18·20	48·21	18·16	332·26	121·62	22·12
6	19·28	+ 7·26	260·20	17·98	48·25	+ 18·16	257·85	121·19	+ 22·10
7	19·29	7·25	309·48	17·76	48·28	18·15	183·44	120·76	22·08
8	19·30	7·25	358·75	17·54	48·30	18·14	109·03	120·33	22·06
9	19·30	7·24	48·02	17·32	48·30	18·12	34·61	119·91	22·04
10	19·29	7·23	97·29	17·10	48·28	18·10	320·19	119·49	22·02
11	19·28	7·22	146·56	16·88	48·25	18·07	245·77	119·07	22·00
12	19·26	7·21	195·82	16·66	48·20	18·04	171·35	118·65	21·98

	Phobos.						*Deimos.*		
Greenwich Noon. 1886.	a_1	b_1	$u-U$	P	a_2	b_2	$u-U$	U	B
	″	″	°	°	″	″	°	°	°
Mar. 13	19·24	7·19	245·08	16·44	48·13	18·00	96·92	118·24	21·96
14	19·21	7·18	294·33	16·22	48·05	17·96	22·49	117·84	21·95
15	19·17	7·16	343·57	16·00	47·96	17·91	308·05	117·44	21·93
16	19·12	+ 7.14	32·80	15·79	47·85	+ 17·86	233·60	117·04	+ 21·92
17	19·07	7·11	82·03	15·58	47·72	17·80	159·15	116·65	21·90
18	19·01	7·09	131·25	15·37	47·58	17·74	84·69	116·27	21·89
19	18·95	7·06	180·45	15·17	47·43	17·67	10·22	115·90	21·88
20	18·89	7·03	229·65	14·97	47·27	17·60	295·74	115·53	21·87
21	18·82	7·00	278·84	14·78	47·09	17·53	221·25	115·18	21·86
22	18·74	6·97	328·01	14·59	46·90	17·45	146·76	114·83	21·85
23	18·66	6·94	17·18	14·41	46·70	17·37	72·25	114·50	21·84
24	18·58	6·91	66·33	14·23	46·49	17·29	357·73	114·17	21·84
25	18·49	6·88	115·47	14·06	46·27	17·21	283·20	113·86	21·83
26	18·40	6·84	164·60	13·89	46·04	17·12	208·65	113·56	21·83
27	18·30	6·81	213·71	13·73	45·80	17·03	134·10	113·27	21·83
28	18·20	6·77	262·81	13·57	45·55	16·94	59·53	112·99	21·83
29	18·10	6·73	311·90	13·42	45·29	16·85	344·95	112·73	21·83
30	18·00	6·69	0·98	13·28	45·03	16·75	270·36	112·48	21·84
31	17·89	6·66	50·04	13·15	44·76	16·66	195·75	112·24	21·85
Apr. 1	17·78	+ 6·62	99·08	13·02	44·48	+ 16·56	121·13	112·01	+ 21·86
2	17·67	6·58	148·11	12·90	44·20	16·47	46·50	111·80	21·87
3	17·55	6·54	197·13	12·79	43·91	16·37	331·85	111·60	21·88
4	17·43	6·50	246·13	12·69	43·62	16·27	257·19	111·42	21·90
5	17·31	6·46	295·12	12·59	43·32	16·17	182·51	111·25	21·92
6	17·19	6·42	344·09	12·50	43·02	16·07	107·82	111·09	21·94
7	17·07	6·38	33·05	12·41	42·72	15·97	33·12	110·95	21·96
8	16·95	6·34	81·99	12·34	42·41	15·87	318·40	110·82	21·98
9	16·82	6·30	130·92	12·27	42·10	15·78	243·67	110·70	22·01
10	16·70	6·26	179·83	12·21	41·79	15·68	163·92	110·60	22·03
11	16·57	6·23	228·73	12·16	41·48	15·58	94·16	110·51	22·06
12	16·45	6·19	277·61	12·12	41·17	15·48	19·39	110·44	22·10
13	16·32	6·15	326·48	12·09	40·85	15·39	304·60	110·38	22·31
14	16·20	6·11	15·34	12·06	40·53	15·29	229·79	110·33	22·17
15	16·07	+ 6·07	64·18	12·04	40·22	+ 15·20	154·98	110·30	+ 22·21

These values are to be interpolated for the times for which the positions of the satellites are required, the equation of light having already been taken into account. The position-angles p and distances s are then to be found by means of the formulæ

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$$s \sin(p - P) = a \sin(u - U)$$
$$s \cos(p - P) = b \cos(u - U).$$

The satellites move in the direction of *in*creasing position-angles, and will be at their greatest eastern and western elongation (e in pos. P + 90° and w in pos. P − 90°) about the following Greenwich mean times :—

		Phobos.		*Deimos.*			*Phobos.*		*Deimos.*
1886.		h	h	h	1886.		h	h	h
Feb.	10	10·0 *w*	13·8 *e*	17·2 *e*	Mar.	12	9·2 *w*	13·0 *e*	8·3 *w*
	11	12·8 *e*	16·6 *w*	8·3 *w*		13	12·0 *e*	15·8 *w*	14·5 *w*
	12	11·7 *e*	15·6 *w*	14·6 *w*		14	11·0 *e*	14·8 *w*	5·7 *e*
	13	10·7 *e*	14·5 *w*	20·9 *w*		15	9·9 *e*	13·7 *w*	11·9 *e*
	14	13·5 *w*	17·3 *e*	12·0 *e*		16	12·7 *w*	16·5 *e*	18·2 *e*
	15	12·4 *w*	16·3 *e*	18·3 *e*		17	11·6 *w*	15·5 *e*	9·3 *w*
	16	11·4 *w*	15·2 *e*	9·4 *w*		18	10·6 *w*	14·4 *e*	15·6 *w*
	17	10·3 *w*	14·2 *e*	15·7 *w*		19	9·5 *w*	13·4 *e*	6·7 *e*
	18	13·1 *e*	17·0 *w*	6·8 *e*		20	12·3 *e*	16·2 *w*	13·0 *e*
	19	12·1 *e*	15·9 *w*	13·1 *e*		21	11·3 *e*	15·1 *w*	19·2 *e*
	20	11·0 *e*	14·9 *w*	19·3 *e*		22	10·2 *e*	14·1 *w*	10·3 *w*
	21	13·8 *w*	17·6 *e*	10·5 *w*		23	9·2 *e*	13·0 *w*	16·6 *w*
	22	12·8 *w*	16·6 *e*	16·7 *w*		24	12·0 *w*	15·8 *e*	7·8 *e*
	23	11·7 *w*	15·6 *e*	7·8 *e*		25	10·9 *w*	14·8 *e*	14·0 *e*
	24	10·7 *w*	14·5 *e*	14·1 *e*		26	9·9 *w*	13·7 *e*	5·2 *w*
	25	13·5 *e*	17·3 *w*	20·4 *e*		27	8·8 *w*	12·7 *e*	11·4 *w*
	26	12·4 *e*	16·2 *w*	11·5 *w*		28	11·6 *e*	15·4 *w*	17·7 *w*
	27	11·4 *e*	15·2 *w*	17·8 *w*		29	10·6 *e*	14·4 *w*	8·8 *e*
	28	10·3 *e*	14·1 *w*	8·9 *e*		30	9·5 *e*	13·4 *w*	15·1 *e*
Mar.	1	13·1 *w*	16·9 *e*	15·1 *e*		31	8·5 *e*	12·3 *w*	6·2 *w*
	2	12·0 *w*	15·9 *e*	6·3 *w*	Apr.	1	11·3 *w*	15·1 *e*	12·5 *w*
	3	11·0 *w*	14·8 *e*	12·5 *w*		2	10·2 *w*	14·1 *e*	18·8 *w*
	4	13·8 *e*	17·6 *w*	18·8 *w*		3	9·2 *w*	13·0 *e*	9·9 *e*
	5	12·7 *e*	16·6 *w*	9·9 *e*		4	8·2 *w*	12·0 *e*	16·2 *e*
	6	11·7 *e*	15·5 *w*	16·1 *e*		5	11·0 *e*	14·8 *w*	7·4 *w*
	7	10·6 *e*	14·5 *w*	7·3 *w*		6	9·9 *e*	13·7 *w*	13·6 *w*
	8	13·4 *w*	17·2 *e*	13·5 *w*		7	8·9 *e*	12·7 *w*	4·8 *e*
	9	12·4 *w*	16·2 *e*	19·8 *w*		8	7·8 *e*	11·6 *w*	11·1 *e*
	10	11·3 *w*	15·1 *e*	10·9 *e*		9	10·6 *w*	14·4 *e*	17·4 *e*
	11	10·3 *w*	14·1 *e*	17·2 *e*		10	9·6 *w*	13·4 *e*	8·5 *w*